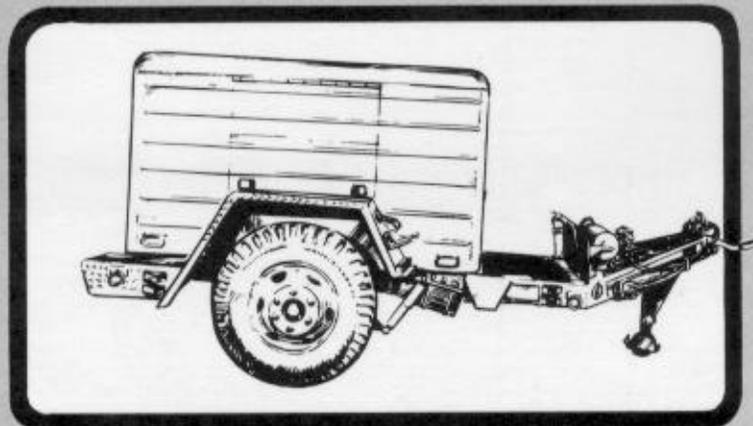


**ARMY FM 10-533
AIR FORCE TO 13C7-3-391**



**AIRDROP OF SUPPLIES AND EQUIPMENT
RIGGING
TRAILER-MOUNTED
LUBRICATION UNIT**

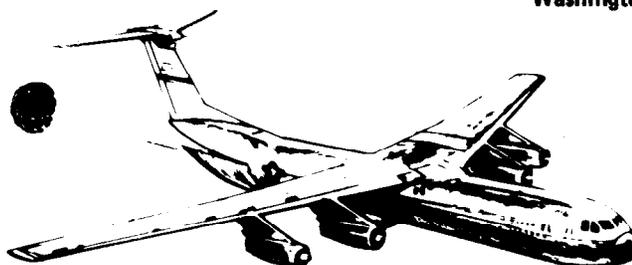


DISTRIBUTION RESTRICTION: This publication contains technical or operational information that is for official Government use only. Distribution is limited to US Government agencies. Requests from outside the US Government for release of this publication under the Freedom of Information Act or the Foreign Military Sales Program must be made to HQ TRADOC, Ft Monroe, VA 23651.

DEPARTMENTS OF THE ARMY AND THE AIR FORCE

FIELD MANUAL
NO 10-533
TECHNICAL ORDER
NO 13C7-3-391

DEPARTMENTS OF THE ARMY
AND THE AIR FORCE
Washington, DC, 5 March 1984

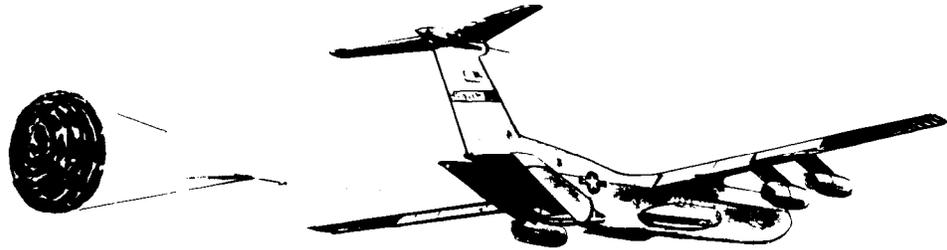


AIRDROP OF SUPPLIES AND EQUIPMENT RIGGING TRAILER-MOUNTED LUBRICATION UNIT

TABLE OF CONTENTS

	Paragraph	Page
PREFACE		iii
CHAPTER 1. INTRODUCTION		
Description of Item	1-1	1-1
Special Considerations	1-2	1-1
CHAPTER 2. RIGGING THE LUBE UNIT FOR A LOW-VELOCITY AIRDROP		
Description of Load	2-1	2-1
Preparing Platform	2-2	2-1
Preparing and Placing Honeycomb	2-3	2-1
Preparing Trailer-Mounted Lube Unit	2-4	2-4
Preparing Engine	2-5	2-6
Preparing Lubricator	2-6	2-6
Securing Top Cover	2-7	2-10
Installing Suspension Slings	2-8	2-10
Positioning Load	2-9	2-10
Lashing Load	2-10	2-12
Safetying Suspension Slings	2-11	2-15
Stowing Cargo Parachutes	2-12	2-15
Installing Extraction System	2-13	2-19
Installing Release System	2-14	2-20
Placing Extraction Parachute	2-15	2-21
Marking Rigged Load	2-16	2-21
Equipment Required	2-17	2-22

	Paragraph	Page
CHAPTER 3. RIGGING THE LUBE UNIT FOR A LAPE AIRDROP		
Description of Load	3-1	3-1
Preparing Platform	3-2	3-1
Preparing and Placing Honeycomb	3-3	3-2
Preparing Load	3-4	3-4
Installing Suspension Slings	3-5	3-4
Positioning Load	3-6	3-4
Lashing Load	3-7	3-5
Installing Attitude Control Bar (ACB)	3-8	3-8
Installing Extraction System	3-9	3-10
Placing Extraction Parachutes	3-10	3-10
Marking Rigged Load	3-11	3-10
Equipment Required	3-12	3-11
GLOSSARY		Glossary-1
REFERENCES		References-1



PREFACE

Scope

This manual tells and shows how to rig the power-operated, portable, trailer-mounted lubrication and service unit (figure 1-1) for a low-velocity airdrop from a C-130 or a C-141 aircraft. (Hereafter in this manual, the lubrication and service unit is referred to as the lube unit.) This manual also covers the rigging of the lube unit for delivery by low-altitude parachute-extraction (LAPE) system airdrop from a C-130 aircraft. This manual is designed for use by all parachute riggers.

User Information

The proponent of this publication is the US Army Quartermaster School. You are encouraged to report any errors or omissions and suggest ways for making this a better manual. Army personnel, send your comments on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to:

**Commandant
US Army Quartermaster School
ATTN: ATSM-DTL
Fort Lee, VA 23801**

Air Force personnel, send your reports on AFTO Form 22 (Technical Order Publication Improvement Report) through:

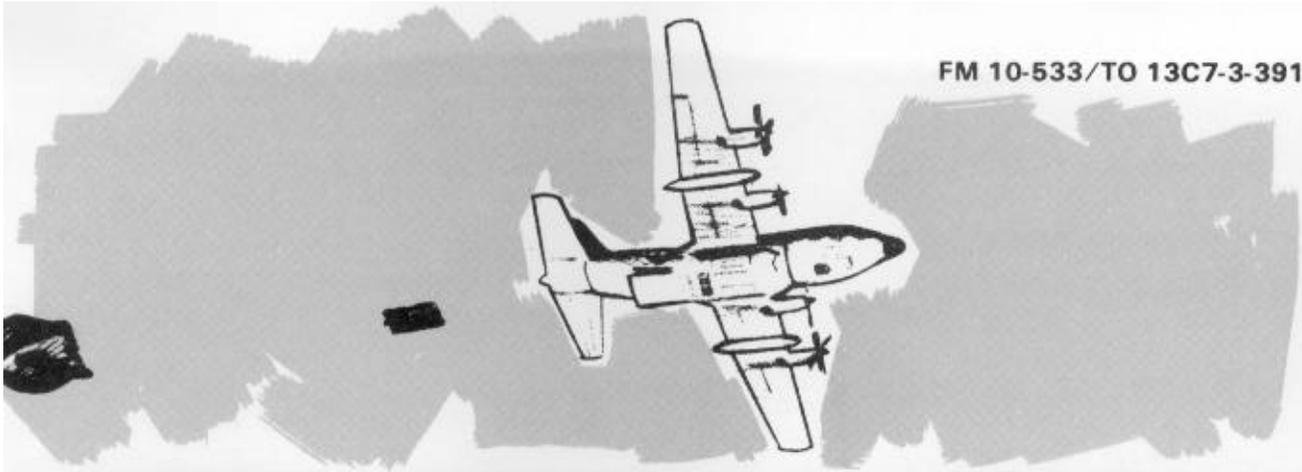
**Headquarters
Military Airlift Command
(MAC/DOXT)
Scott AFB, IL 62225**

to:

**Commandant
US Army Quartermaster School
ATTN: ATSM-DTL
Fort Lee, VA 23801**

Also send information copies of AFTO Form 22 to:

**San Antonio ALC/MMEDTR
Kelly AFB, TX 78241**



CHAPTER 1 INTRODUCTION

1-1. Description of Item

The lube unit is gasoline-driven, portable, and trailer-mounted. Unrigged, the lube unit looks like the one shown in figure 1-1.

1-2. Special Considerations

a. These loads may include a hazardous material—gasoline. When included as a part of these loads, the gasoline must be packaged, marked, and labeled as described in AFR 71-4/

TM 38-250.

b. The lube unit must not be more than three-fourths full of petroleum oils and lubricants when rigged for airdrop. The weight of the POL has been included in the weights listed in this manual.

c. A copy of this manual must be available to the joint airdrop inspectors during the before- and after-loading inspections.

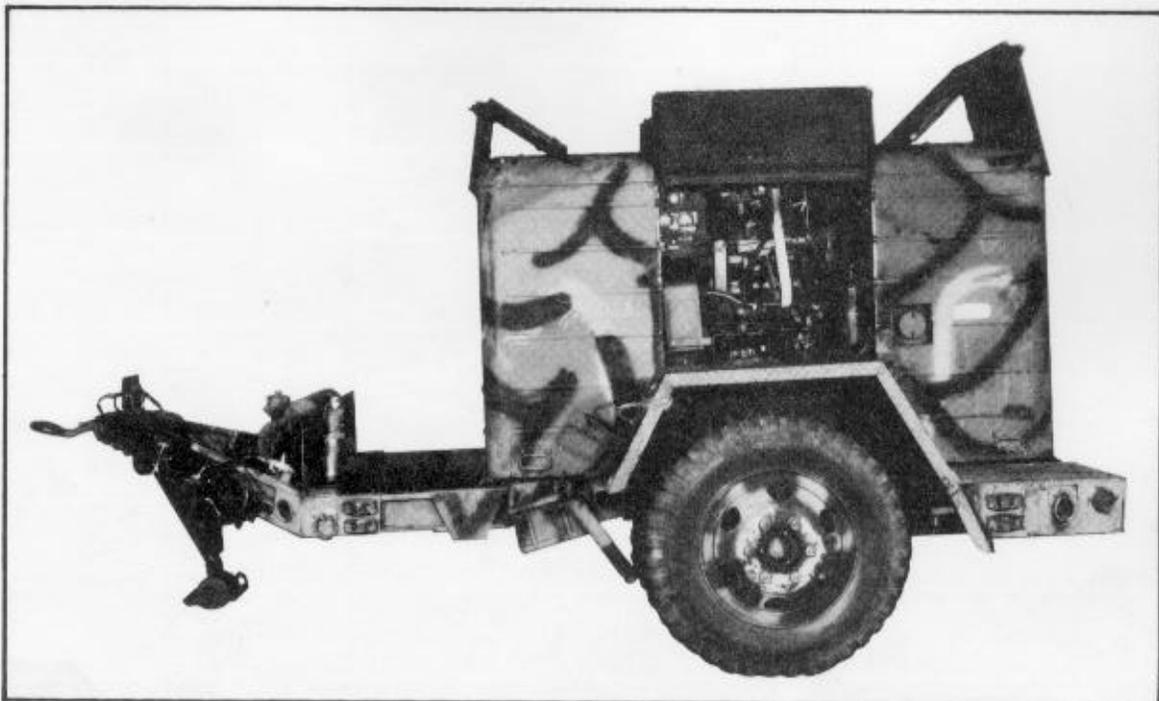


Figure 1-1. Portable, trailer-mounted lube unit.



CHAPTER 2
RIGGING THE LUBE UNIT FOR A LOW-VELOCITY AIRDROP

2-1. Description of Load

The lube unit is rigged on a 16-foot, type II, modular platform with two G-11A or two G-11B cargo parachutes. When the lube unit is three-fourths full of petroleum oils and lubricants, it weighs 5,500 pounds. It is 162 inches long, 80 inches high, and 96 inches wide.

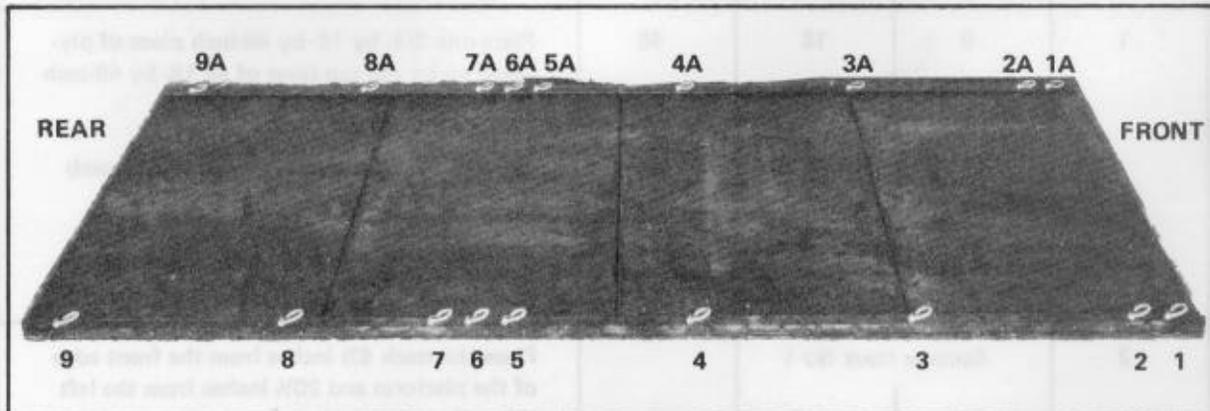
2-2. Preparing Platform

Prepare a 16-foot, type II, modular platform

(figure 2-1) as follows:

a. Inspecting Platform. Inspect, or assemble and inspect, the platform according to procedures outlined in TM 10-1670-208-20&P/TO 13C3-4-12.

b. Installing and Numbering Load Tie-down Clevises. Bolt 18 load tiedown clevises to the platform rails, and number the clevises as shown in figure 2-1.



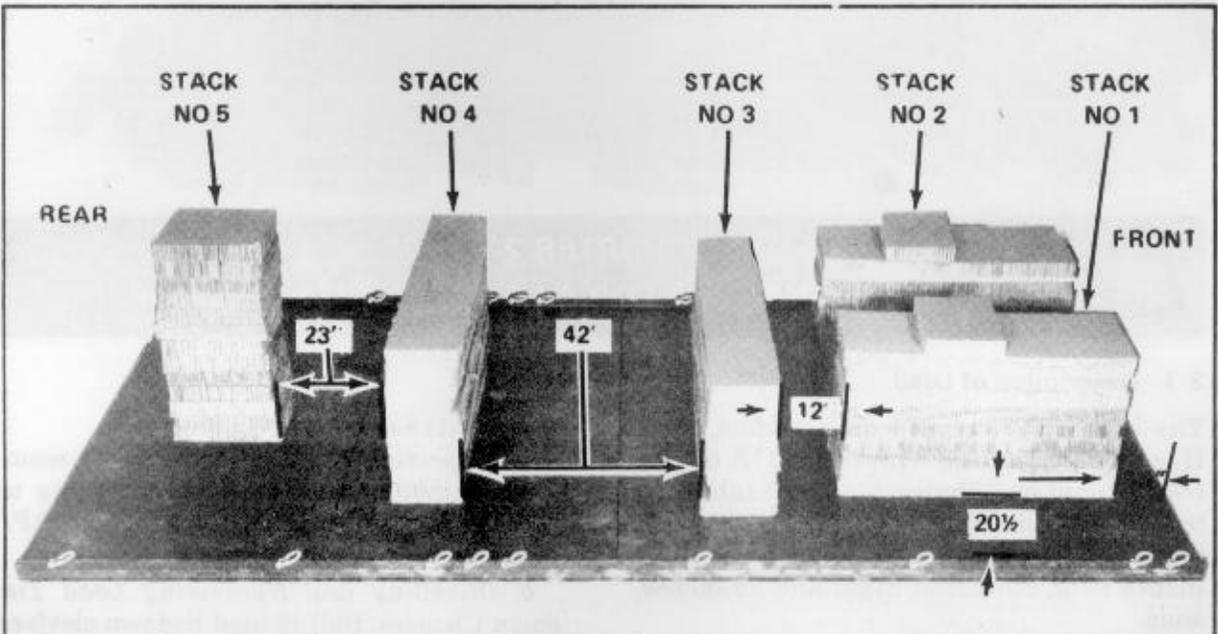
Step:

1. Starting at the front of each rail, bolt a load tiedown clevis to the 2d, 3d, 9th, 15th, 20th, 21st, 22d, 26th, and 32d clevis holes.
2. Starting at the front of the platform, number the clevises bolted to the right rail from 1 through 9 and those bolted to the left rail from 1A through 9A.

Figure 2-1. Platform prepared.

2-3. Preparing and Placing Honeycomb

Build and place five honeycomb stacks as shown in figures 2-2, 2-3, and 2-4.



Stack Number	Pieces	Width (inches)	Length (inches)	Instructions
1	9	18	48	Place one 3/4- by 18- by 48-inch piece of plywood under the top layer of an 18- by 48-inch piece of honeycomb.
	1	18	13	Place an 18- by 13-inch piece of honeycomb 22 inches from front edge of stack. Place the stack 8½ inches from front edge of platform and 20½ inches from right side rail.
2	Same as stack No 1			Place the stack 8½ inches from the front edge of the platform and 20½ inches from the left side rail.
3	8	12	67	Place one 3/4- by 12- by 67-inch piece of plywood under the top layer of honeycomb. Place the stack centered between side rails and 12 inches from the rear of stacks No 1 and 2.
4	10	12	62	Place the stack centered between the side rails and 42 inches from the rear of stack No 3.
5	13	18	18	Place the stack centered between the side rails and 23 inches from the rear of stack No 4.

Figure 2-2. Honeycomb stacks prepared and set in place.

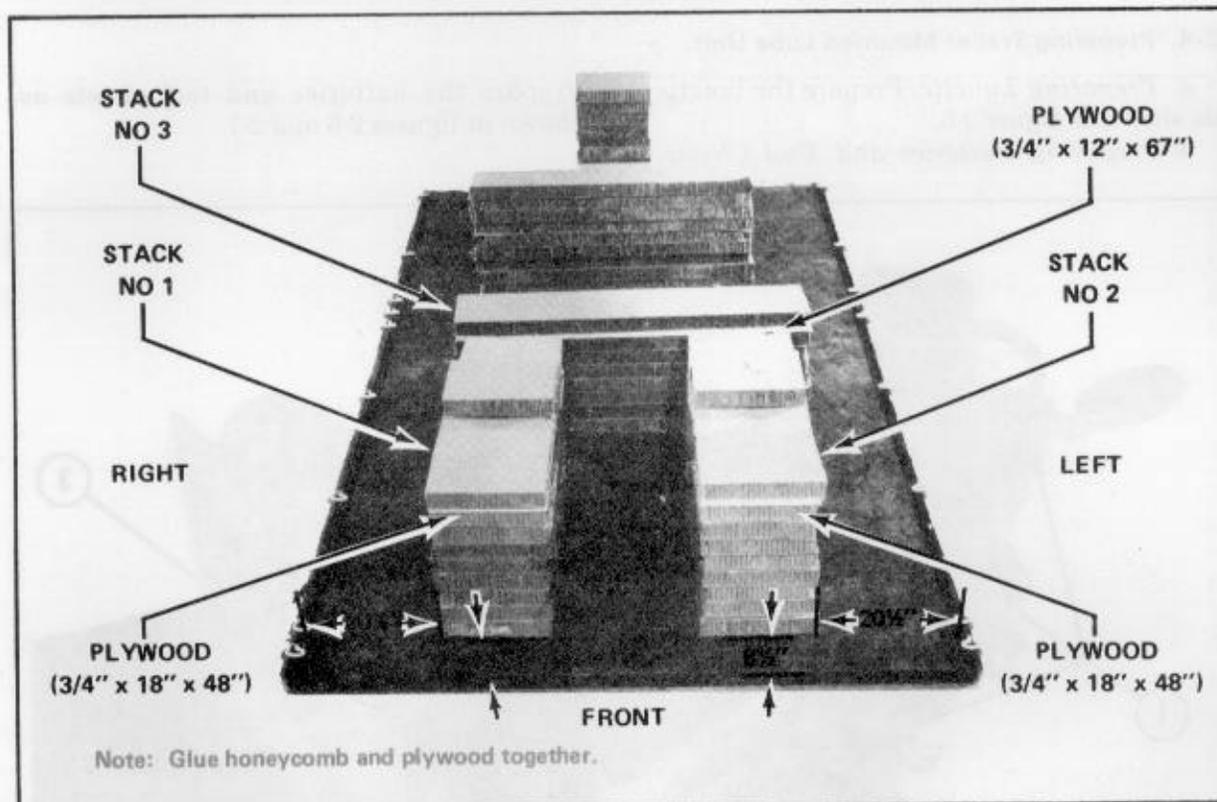


Figure 2-3. Honeycomb stack on platform, front view.

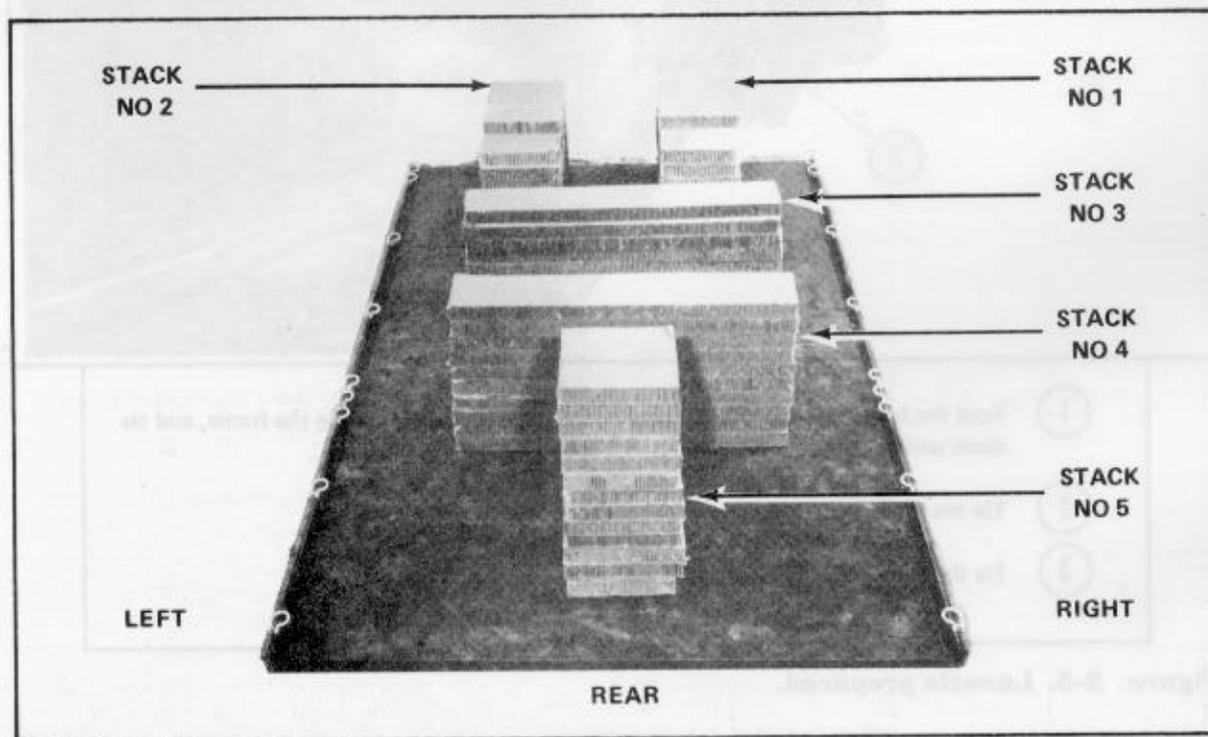


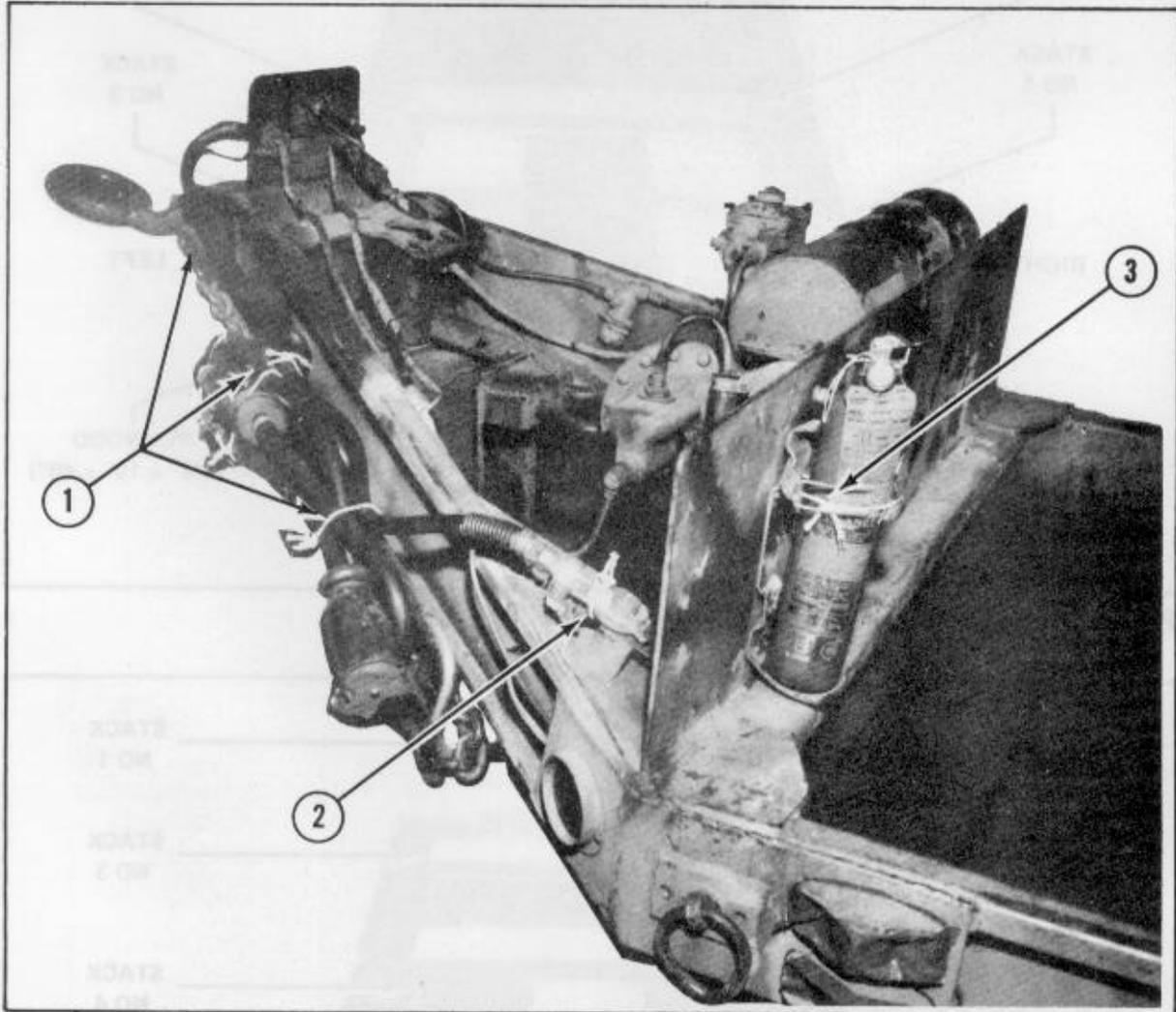
Figure 2-4. Honeycomb stacks on platform, rear view.

2-4. Preparing Trailer-Mounted Lube Unit

a. Preparing Lunette. Prepare the lunette as shown in figure 2-5.

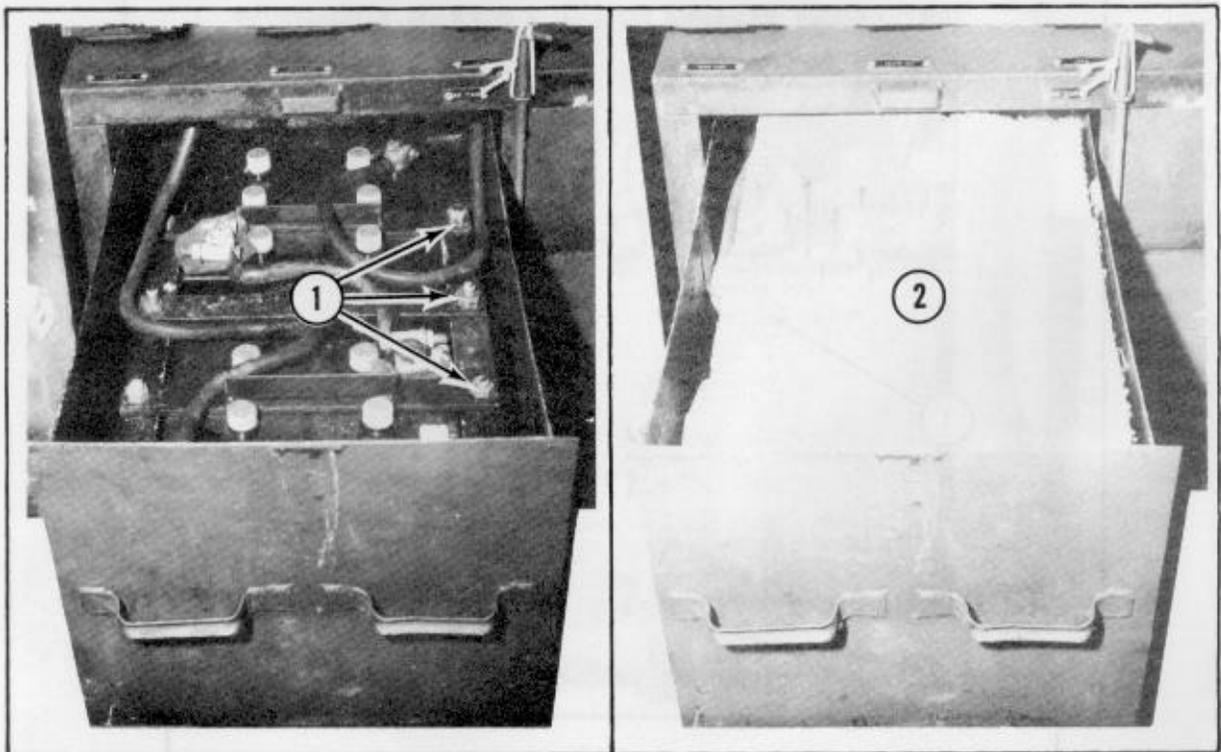
b. Preparing Batteries and Tool Chests.

Prepare the batteries and tool chests as shown in figures 2-6 and 2-7.



- ① Fold the intervehicular cable, brake hose, and safety chains along the frame, and tie them with type III nylon cord.
- ② Tie the brake hose connector in place with type III nylon cord.
- ③ Tie the fire extinguisher in place with type III nylon cord.

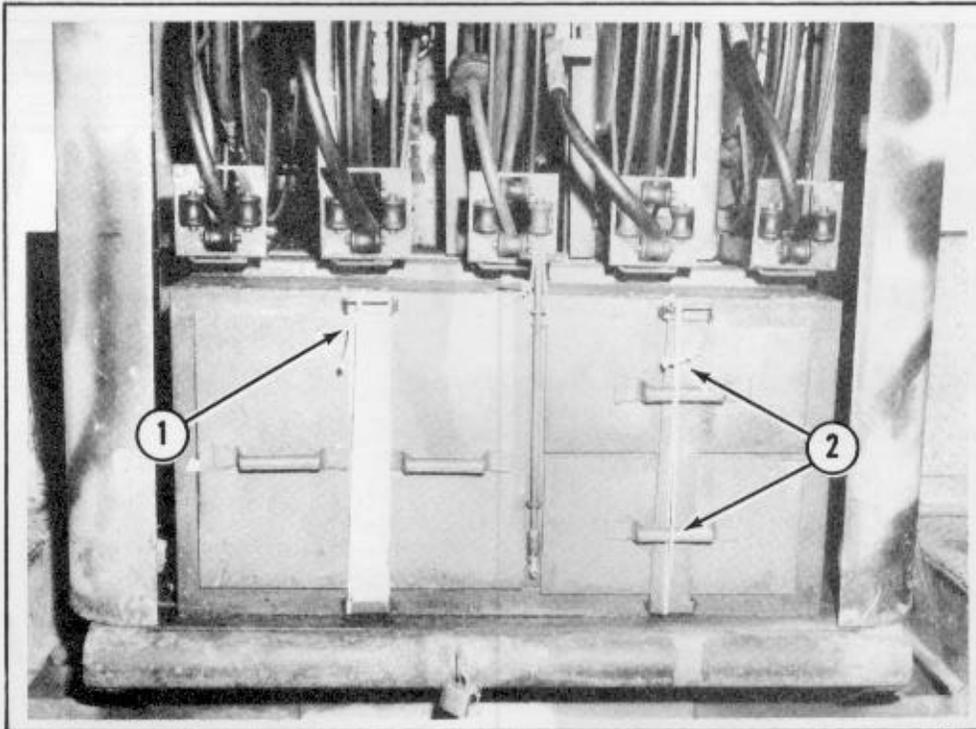
Figure 2-5. Lunette prepared.



Note: Cover the batteries with plastic (honeycomb cover) or other nonflammable material.

- ① Secure the batteries in place by tightening the hold-down clamps.
- ② Cover the plastic layer with a 13- by 18-inch piece of honeycomb.

Figure 2-6. Batteries prepared.



Note: Fill the tool chests with small pieces of honeycomb.

- ① Close the battery box, and tie it in place with type III nylon cord.
- ② Close the tool chests, and tie them shut with type III nylon cord.

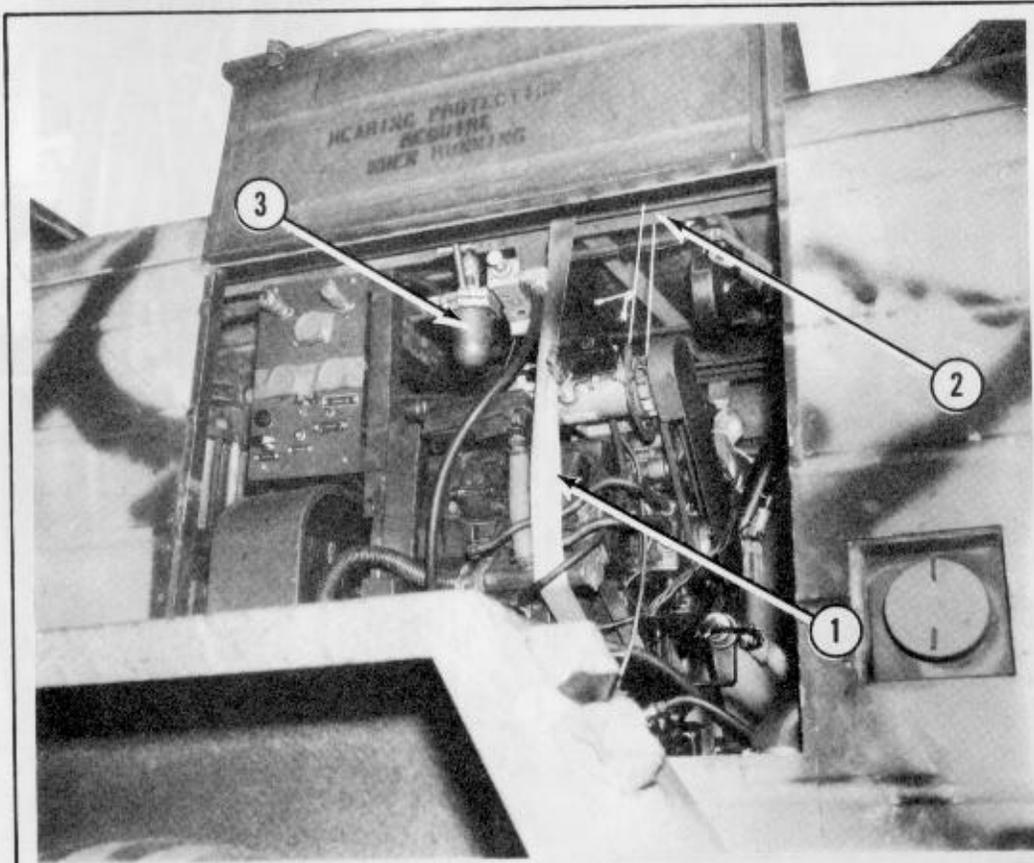
Figure 2-7. Battery box and tool chests secured.

2-5. Preparing Engine

Prepare the engine as shown in figure 2-8.

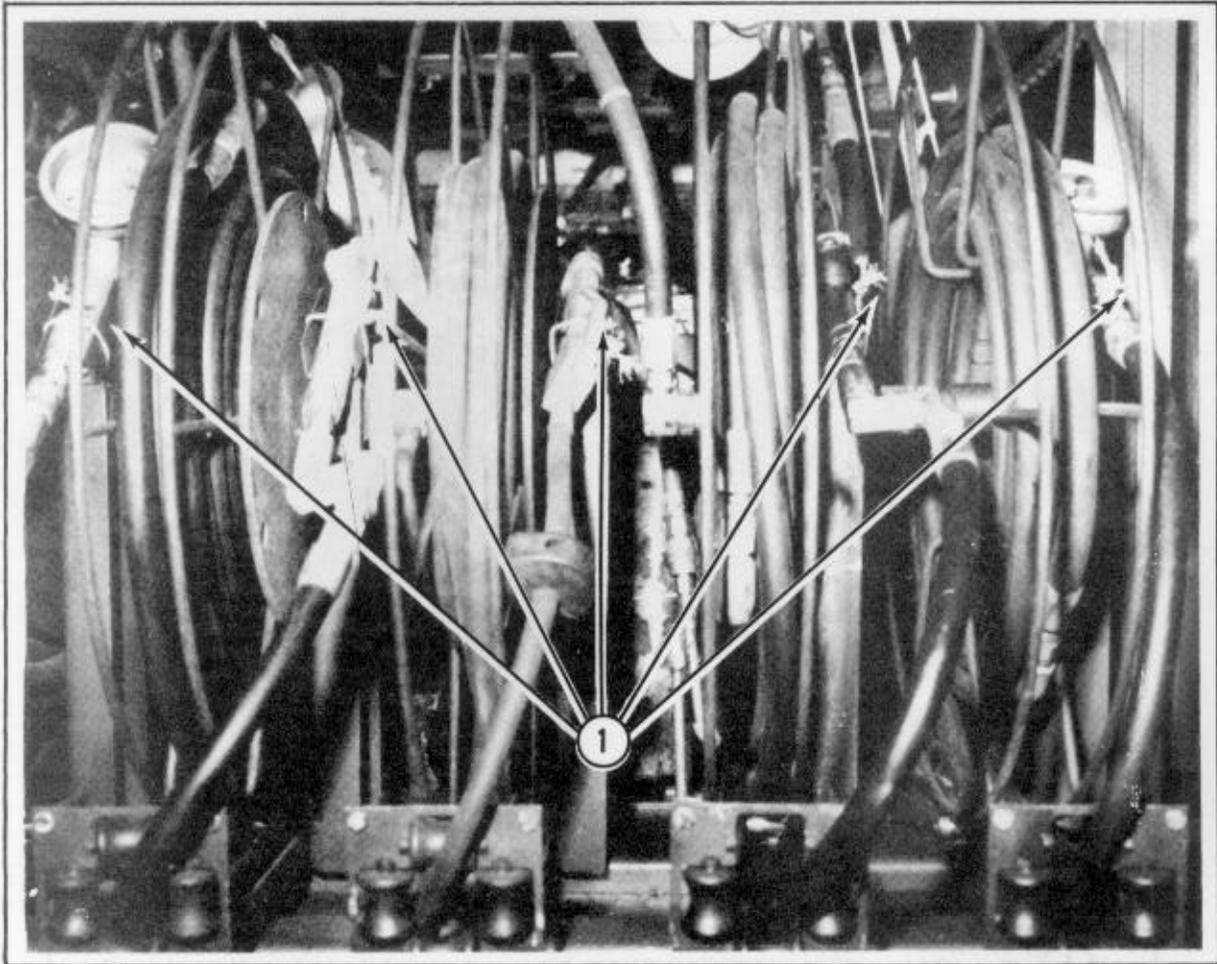
2-6. Preparing Lubricator

Prepare the lubricator as shown in figures 2-9 and 2-10.



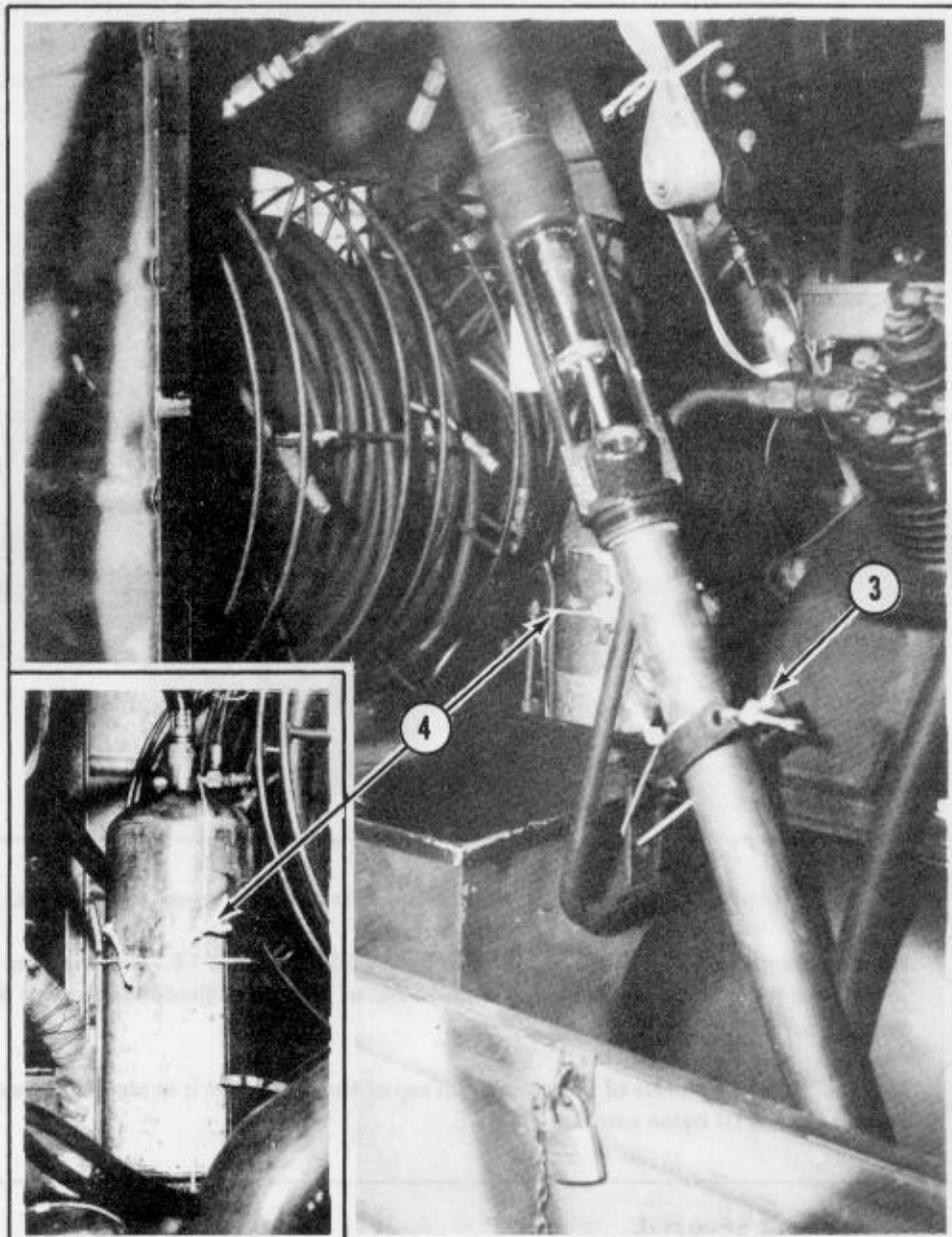
- ① Run a 15-foot tiedown strap over the top frame and around the engine. Hook the ends together with a D-ring and a load binder.
- ② Tie the generator bracket to the top frame with type III nylon cord.
- ③ Pad the fuel bowl with cellulose wadding, and tape it in place.

Figure 2-8. Engine prepared.



- ① Tie the lubricating hose nozzles in their brackets with type III nylon cord.
- ② Tape all glass gages on the instrument panel and the front panel (not shown).

Figure 2-9. Lubricating hose nozzles secured.

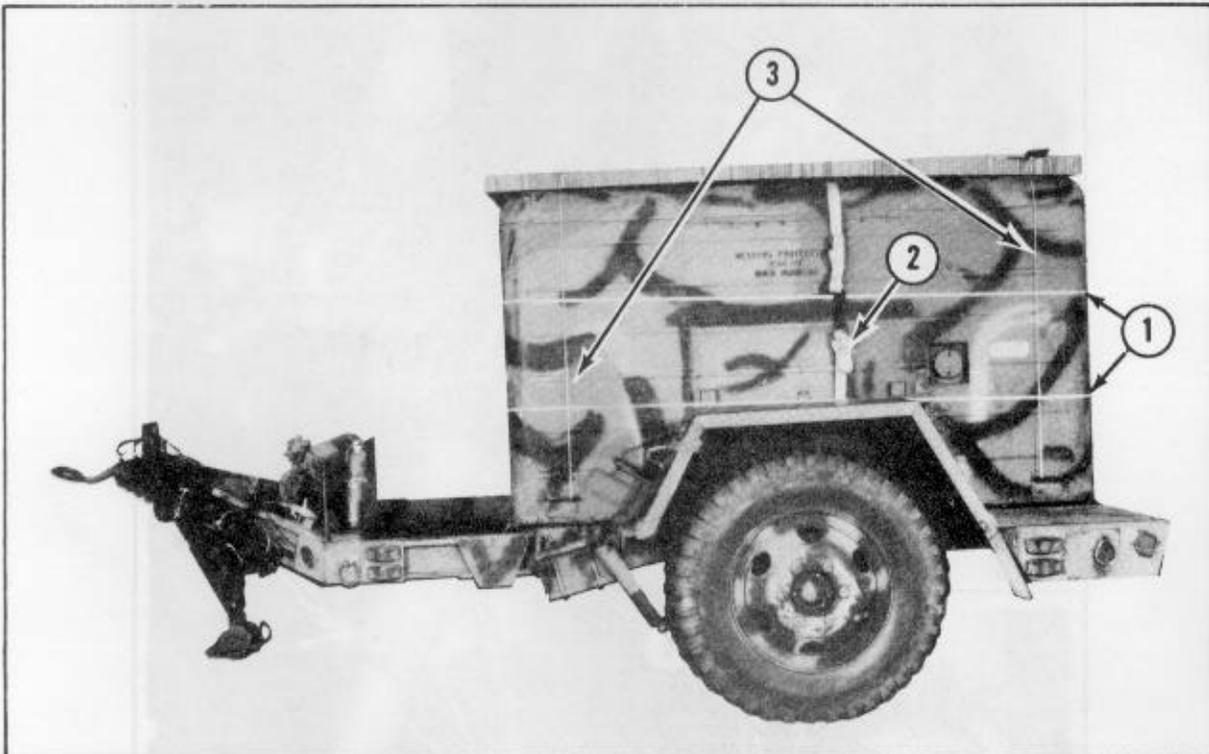


- ③ Tie the balcrank automatic visible oiler in its rack with type III nylon cord.
- ④ Tie the portable greasing unit in its rack with type III nylon cord.

Figure 2-10. Lubricator prepared.

2-7. Securing Top Cover

Secure the top cover of the lube unit as shown in figure 2-11.



- ① Run two lengths of 1/2-inch tubular nylon around the top cover to secure the doors.
- ② Form a 30-foot tiedown strap as outlined in FM 10-500/TO 13C7-1-5. Run the strap around the frame of the lube unit and over the top of the cover. Bind it on the side with two D-rings and a load binder.
- ③ Set a 36- by 96-inch piece of honeycomb on top of the cover. Tie it in place with two lengths of type III nylon cord.

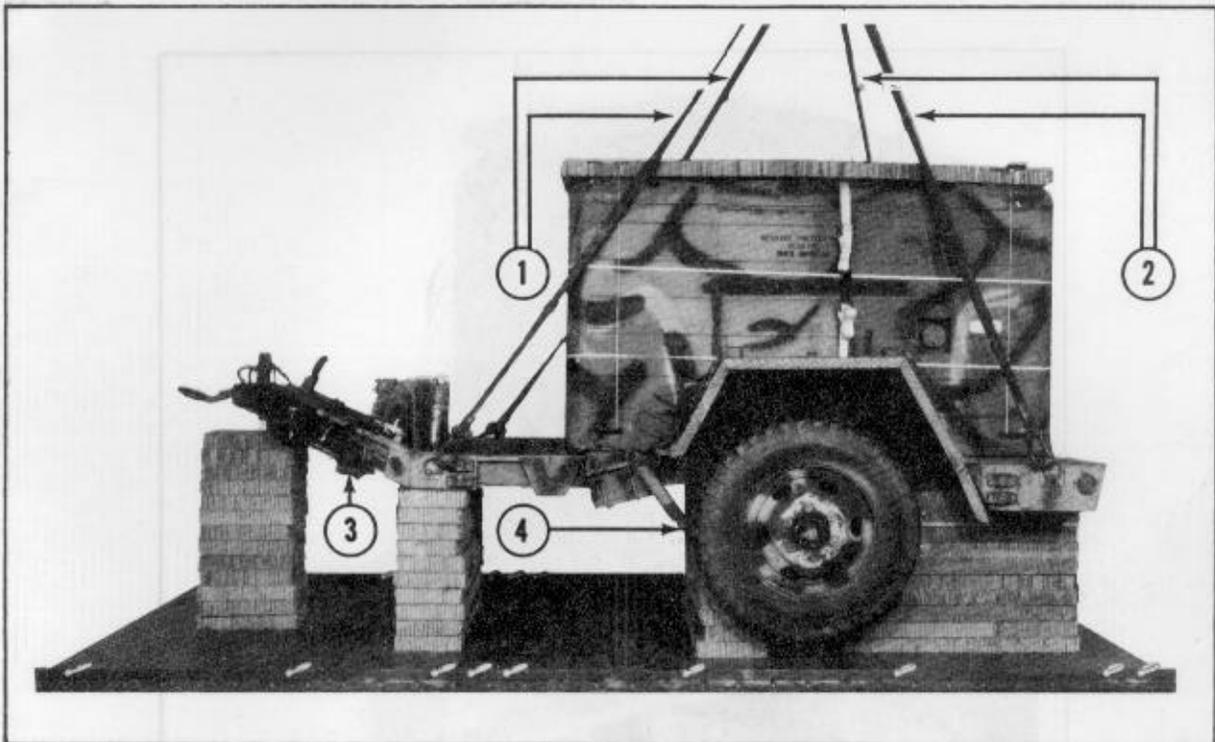
Figure 2-11. Top cover secured.

2-8. Installing Suspension Slings

Use four large suspension clevis assemblies to attach two 11-foot slings and two 12-foot slings to the load for lifting. Bolt the clevises to each lifting point as shown in figure 2-12.

2-9. Positioning Load

Lift the load by using the suspension slings. Set the load on the honeycomb stacks as shown in figure 2-12.



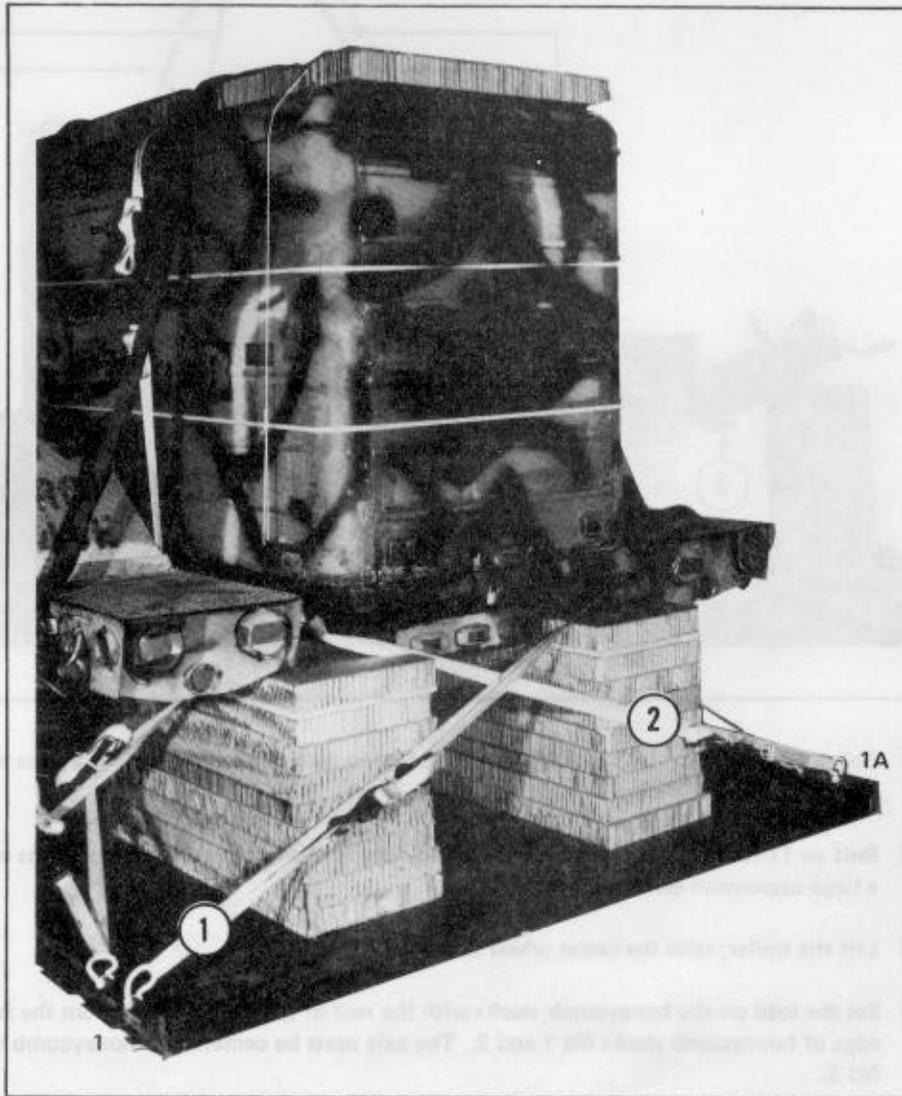
- ① Bolt a 12-foot (2-loop), type XXVI, nylon sling to each of the front lifting points with a large suspension clevis.
- ② Bolt an 11-foot (2-loop), type XXVI, nylon sling to each of the rear lifting points with a large suspension clevis.
- ③ Lift the trailer; raise the caster wheel to the travel position.
- ④ Set the load on the honeycomb stacks with the rear of the trailer 1 inch from the front edge of honeycomb stacks No 1 and 2. The axle must be centered on honeycomb stack No 3.

Note: If type X nylon slings are used, one 3-loop sling will replace each 2-loop, type XXVI, nylon sling.

Figure 2-12. Suspension slings installed and trailer positioned.

2-10. Lashing Load

Use eighteen 15-foot tiedown assemblies to lash the load to the platform as shown in figures 2-13, 2-14, and 2-15.



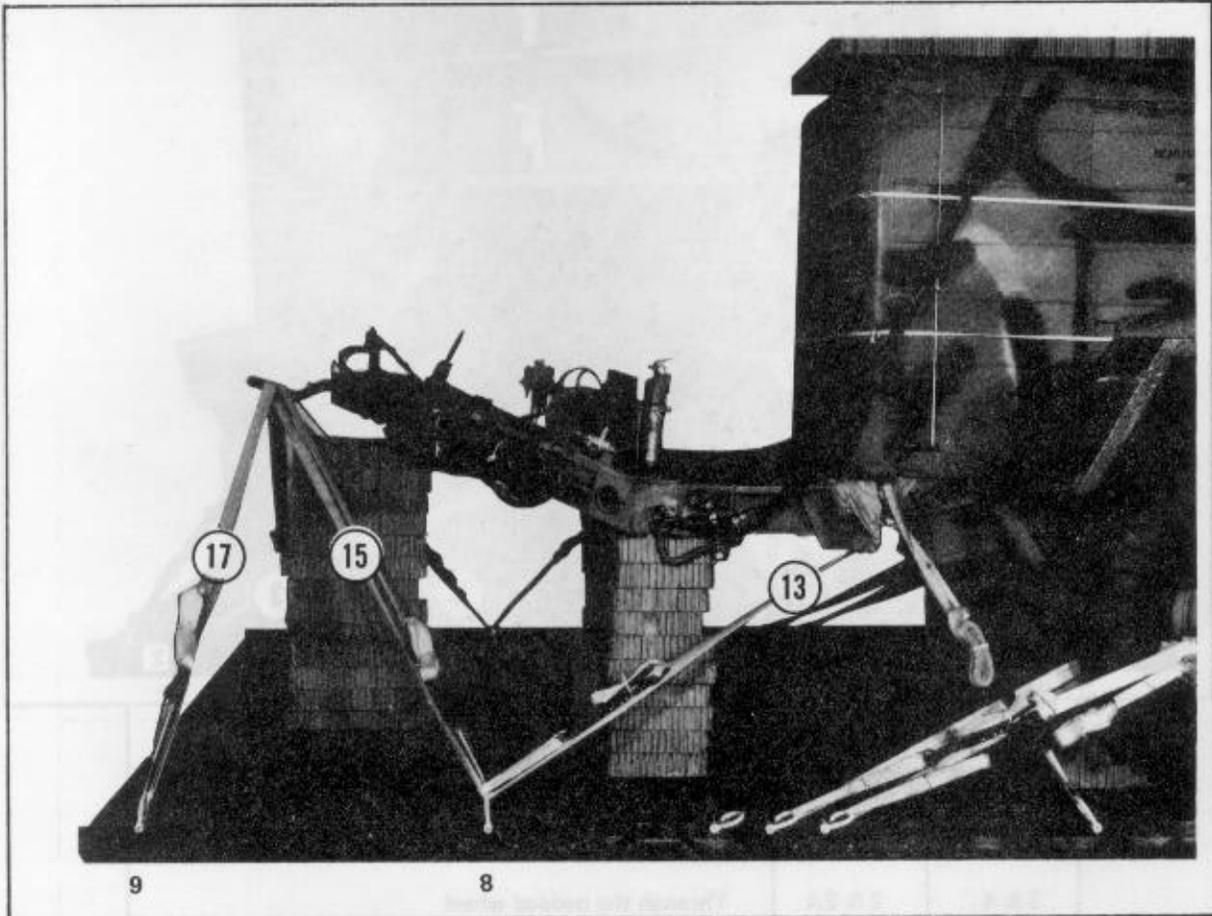
Lashing Number	Tiedown Clevis Number	Instructions
1	1	Through the right rear tiedown provision
2	1A	Through the left rear tiedown provision

Figure 2-13. Lashings 1 and 2 installed.



Lashing Number	Tiedown Clevis Number	Instructions
3 & 4	2 & 2A	Through the padded wheel
5 & 6	3 & 3A	Through the rear tiedown provision
7 & 8	4 & 4A	Around the mainframe in front of the spring support bracket
9 & 10	5 & 5A	Through the padded wheel
11 & 12	6 & 6A	Through the padded wheel

Figure 2-14. Lashings 3 through 12 installed.



Lashing Number	Tiedown Clevis Number	Instructions
13 & 14	8 & 8A	Through the front tiedown provision
15 & 16	8 & 8A	Through the lunette
17 & 18	9 & 9A	Through the lunette

Figure 2-15. Lashings 13 through 18 installed.

2-11. Safetying Suspension Slings

Safety the suspension slings as shown in figure 2-16.

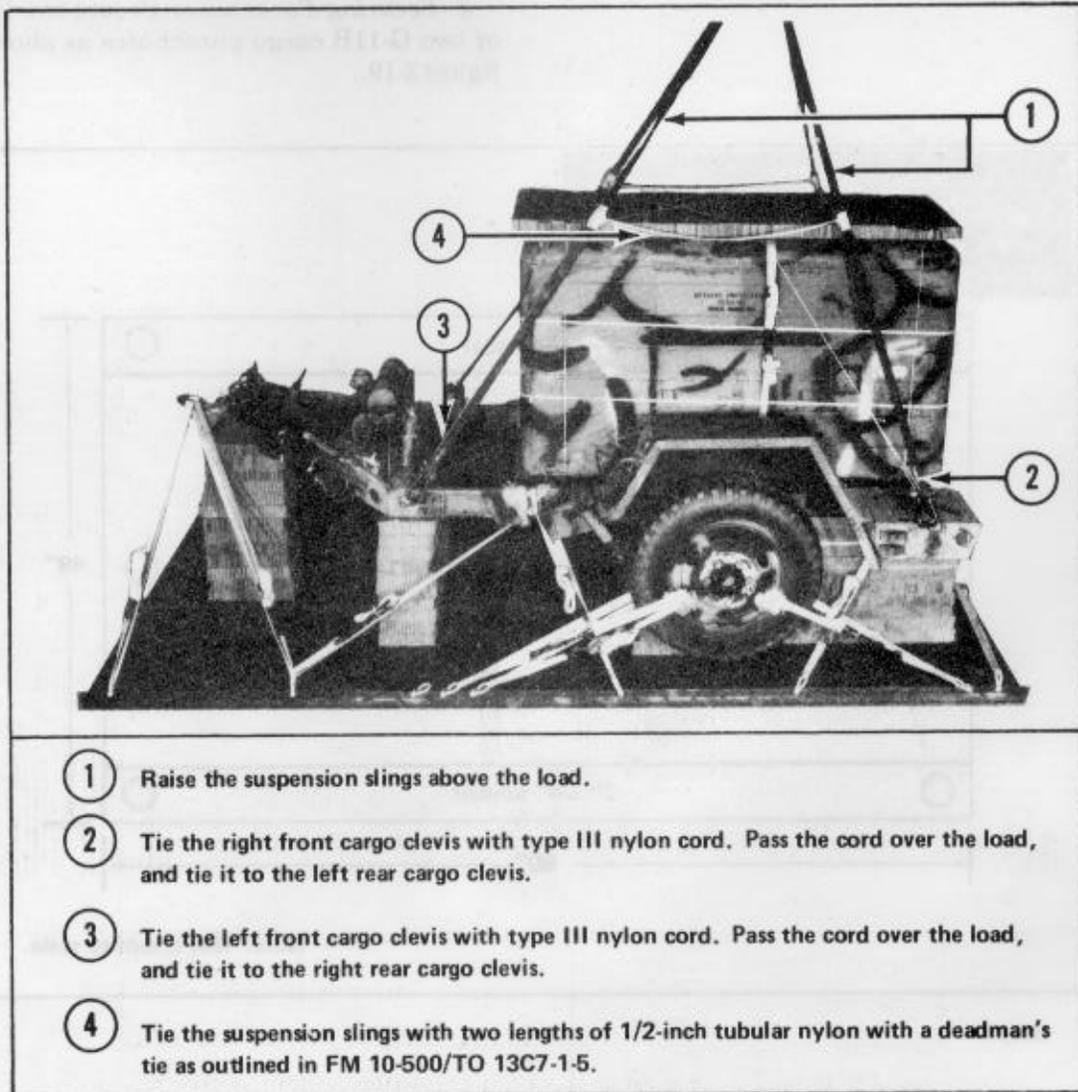


Figure 2-16. Suspension slings safetied.

2-12. Stowing Cargo Parachutes

a. Constructing Parachute Stowage Platform. Use one 3/4- by 48- by 60-inch piece of plywood and two 2- by 4- by 60-inch pieces of lumber to build a stowage platform as shown in figure 2-17.

b. Lashing Stowage Platform. Lash the stowage platform as shown in figure 2-18.

c. *Preparing and Placing Parachutes.* Inspect and prepare either two G-11A or two G-11B cargo parachutes as outlined in FM 10-500/TO 13C7-1-5. Attach the riser extensions to the parachutes, and set them on the platform as outlined in FM 10-500/TO 13C7-1-5 (figure 2-19).

d. *Securing Parachutes.* Secure two G-11A or two G-11B cargo parachutes as shown in figure 2-19.

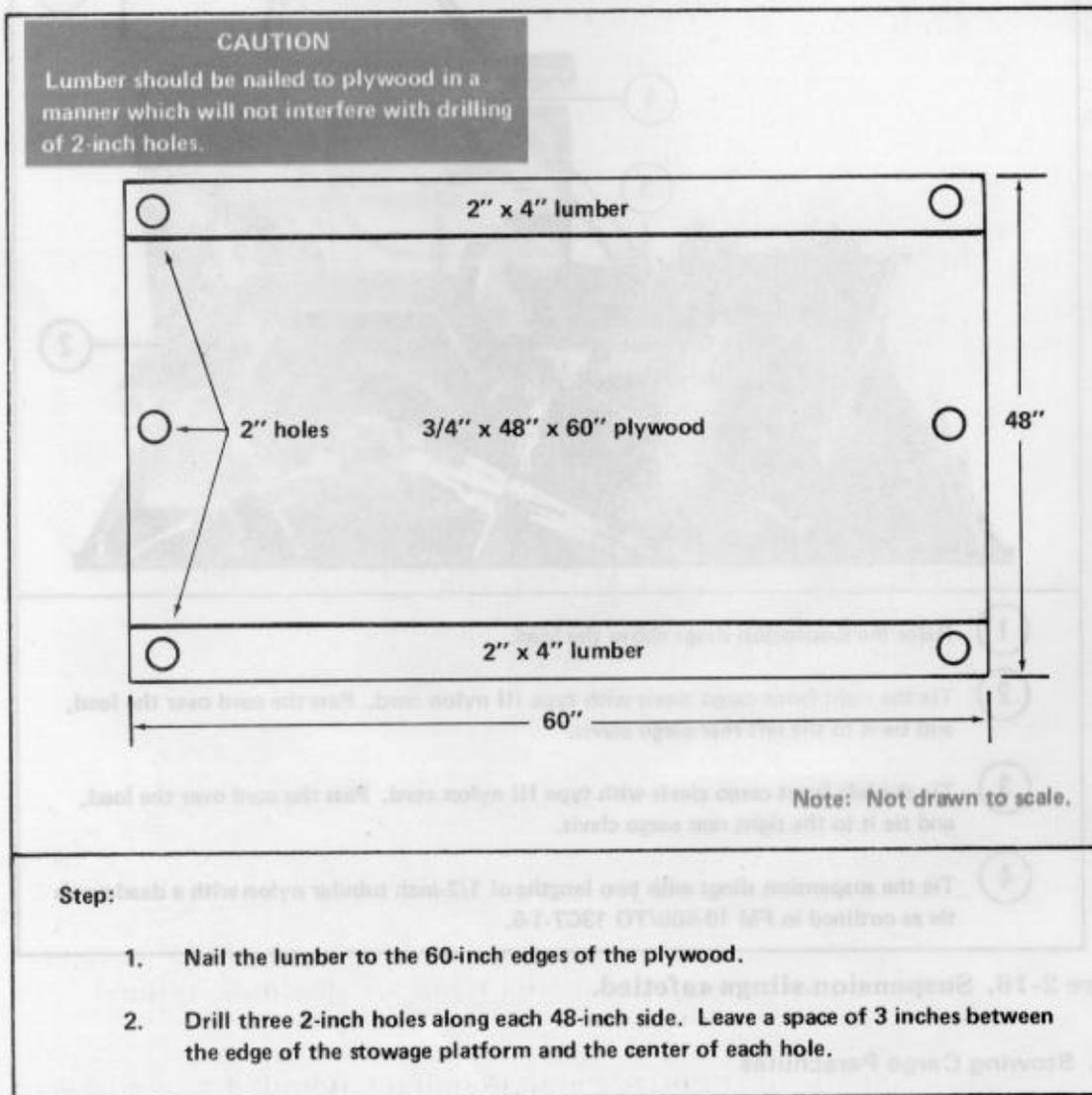
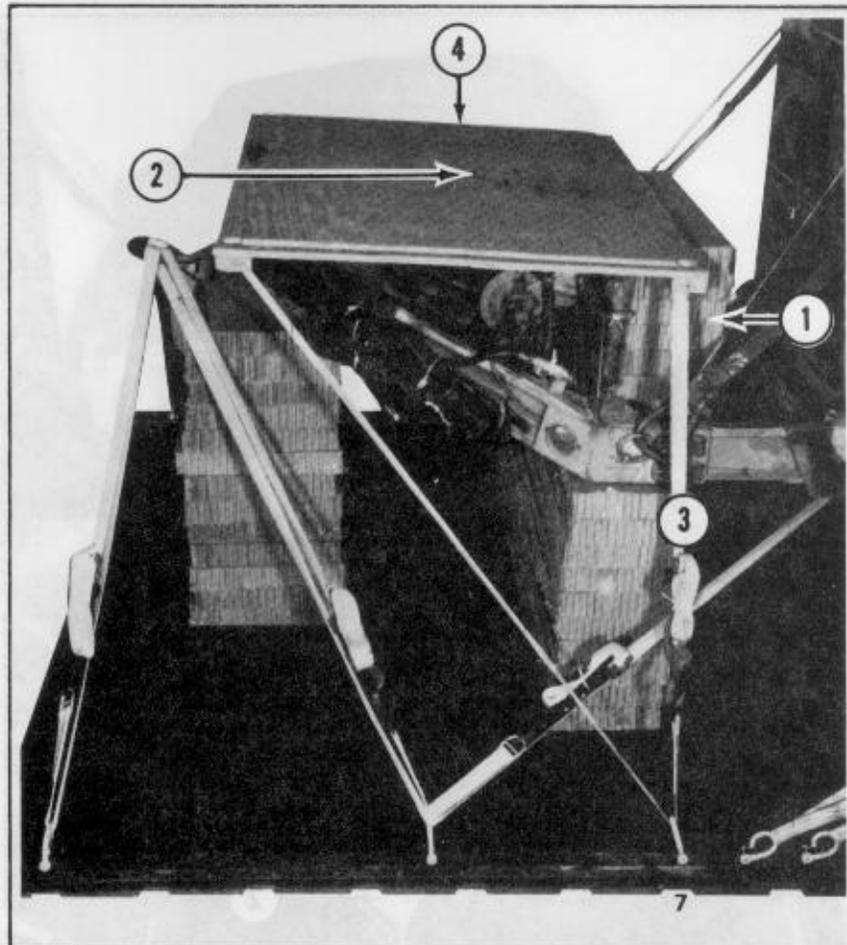
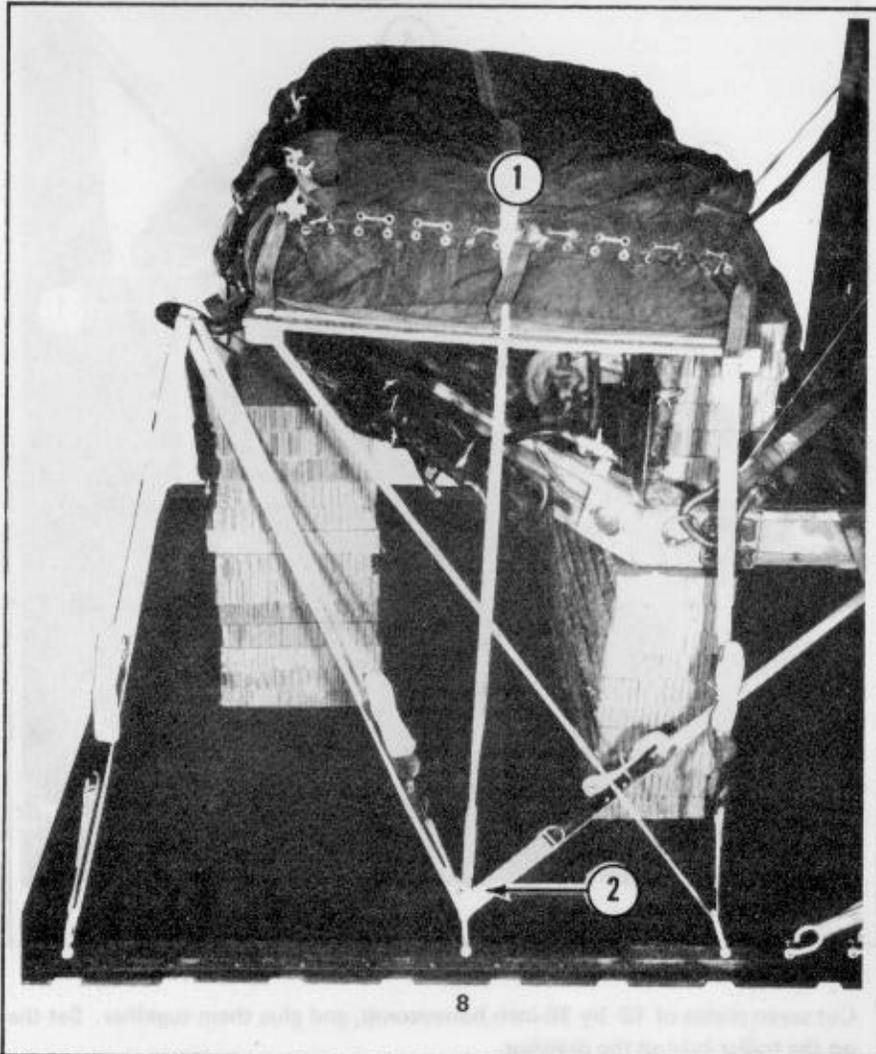


Figure 2-17. Construction of the parachute storage platform.



- ① Cut seven pieces of 12- by 36-inch honeycomb, and glue them together. Set the stack on the trailer behind the drawbar.
- ② Center the platform on the honeycomb stack and drawbar.
- ③ Run a 15-foot tiedown strap through clevis 7, up through the rear hole in the stowage platform, and down through the front hole in the platform. Bind the ends together with a D-ring and a load binder.
- ④ Run another 15-foot tiedown strap through the other side, as described in step 3, using clevis 7A.

Figure 2-18. Stowage platform lashed in place.



- ① Use an 8-yard length of type VIII nylon webbing to form the parachute restraint system as outlined in FM 10-500/TO 13C7-1-5.
- ② Run the strap through the center carrying handles and the center platform holes. Tie the parachute restraint strap to clevises 8 and 8A.

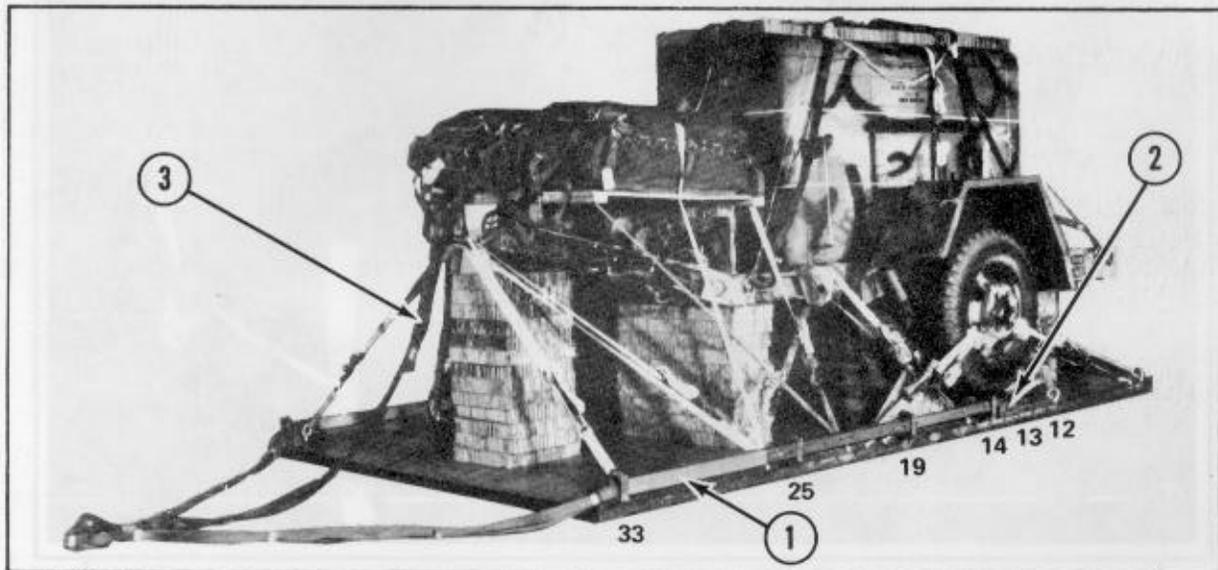
Figure 2-19. Cargo parachutes prepared and stowed.

2-13. Installing Extraction System

Two extraction systems are authorized for use when this load is rigged. These systems are the extraction force transfer coupling (platform) (PEFTC) and the static line/connector strap (SL/CS) extraction system. Install one extraction system as follows:

a. Installing PEFTC. Install the PEFTC as outlined in FM 10-500/TO 13C7-1-5 and as shown in figure 2-20.

b. Installing SL/CS. Use a 60-inch connector strap and a 12-foot (3-loop), type X or (2-loop), type XXVI sling as a deployment line. Prepare and attach the extraction system to the lunette as outlined in FM 10-500/TO 13C7-1-5.

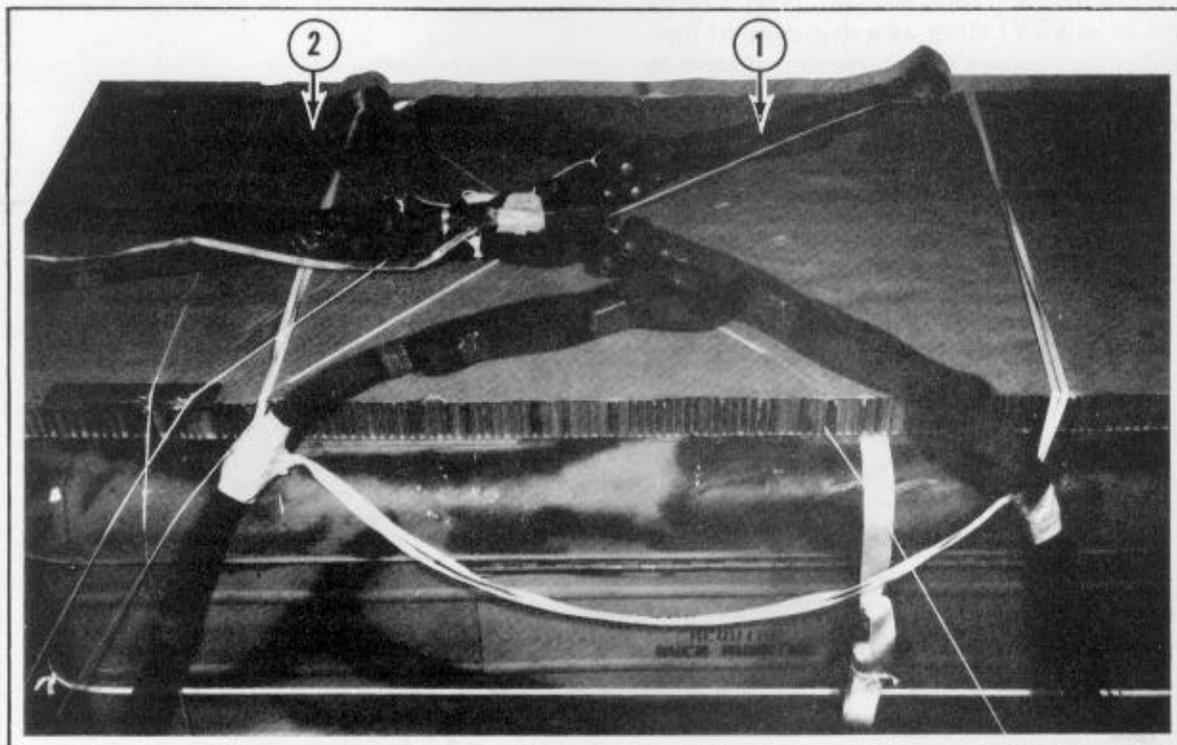


- ① Bolt the guidance tube brackets to the 14th, 19th, 25th, and 33d clevis holes on both sides of the platform.
- ② Bolt the actuators to the 12th and 13th clevis holes.
- ③ Use a 16-foot (3-loop), type X or type XXVI sling as the deployment line.
- ④ Complete the installation of the PEFTC as outlined in FM 10-500/TO 13C7-1-5.

Figure 2-20. PEFTC installed.

2-14. Installing Release System

Prepare and install an M-1 cargo parachute release assembly according to FM 10-500/TO 13C7-1-5 and figure 2-21. If the M-1 release assembly is not available, prepare, attach, and safety two 5,000-pound-capacity cargo parachute release assemblies according to FM 10-500/TO 13C7-1-5.



- ① Run a length of type III nylon cord around the lower spacer. Tie the ends of the cord to points on the front of the load or platform.
- ② Run a length of type III nylon cord through the connectors. Tie the ends of the cord to points on the rear of the load or platform.

Note: The 5,000-pound-capacity release assemblies **MUST NOT** be used when G-11B cargo parachutes are rigged as part of this load.

Figure 2-21. M-1 release installed.

2-15. Placing Extraction Parachute

a. *C-130 Aircraft.* Place an unreefed 15-foot cargo extraction parachute on the load for installation in the aircraft.

b. *C-141 Aircraft.* Place an unreefed 15-foot cargo extraction parachute, with a 36-inch adapter web and a continuous 160-foot (1-loop), type XXVI, nylon extraction line on the load for installation in the aircraft. Use a type IV link to connect the line to the adapter web.

Note: The extraction line **MUST** be a continuous 160-foot, type XXVI, nylon extraction line. Shorter lines **WILL NOT** be used to form the 160-foot extraction line.

2-16. Marking Rigged Load

Mark the rigged load as outlined in FM 10-500/TO 13C7-1-5 and as shown in figure 2-22.

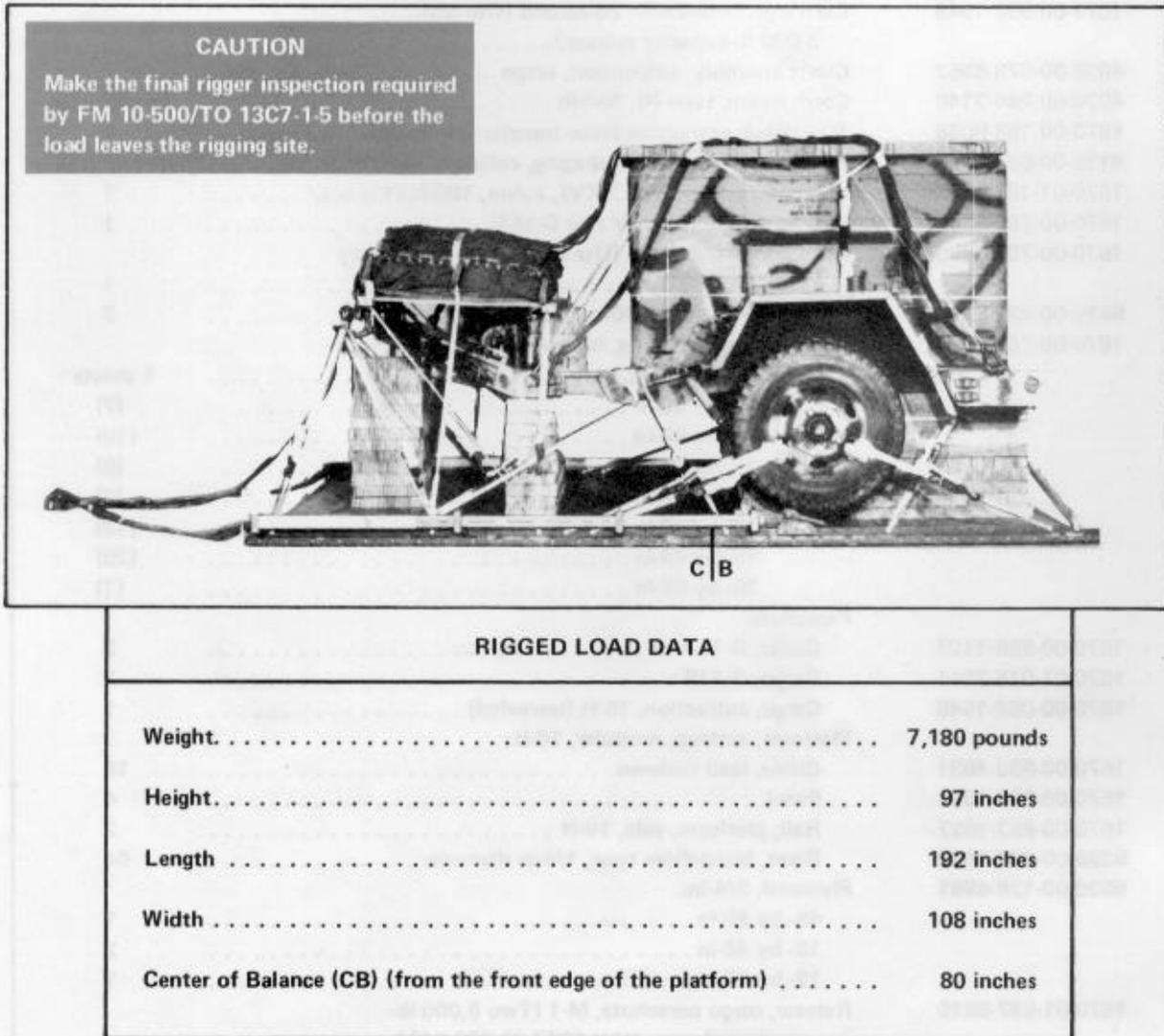


Figure 2-22. Lube unit rigged for a low-velocity airdrop.

2-17. Equipment Required

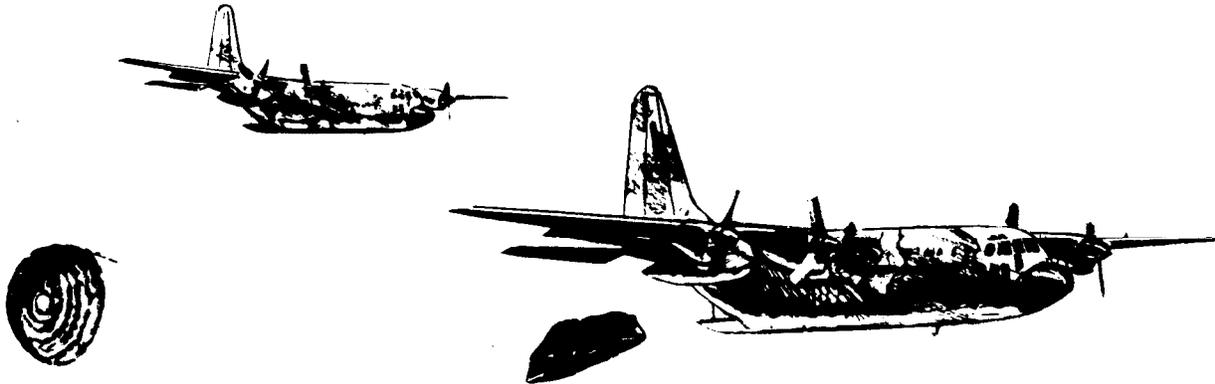
The equipment required for rigging this load is listed in table 2-1.

Table 2-1. Equipment required for rigging the lube unit for a low-velocity airdrop.

National Stock Number	Item	Quantity
1670-00-040-8215	Adapter web, 36-in (for C-141)	1
8040-00-273-8713	Adhesive, paste, 1-gal	As required
1377-00-958-1048	Cartridge, time-delay, 20-second (Use with 5,000-lb-capacity release.)	2
4030-00-678-8562	Clevis assembly, suspension, cargo	7
4020-00-240-2146	Cord, nylon, type III, 550-lb	As required
1670-00-168-6068	*Coupling, extraction force transfer (platform)	1
8135-00-664-6958	Cushioning material, packaging, cellulose wadding	As required
1670-01-107-7652	Line, extraction, type XXVI, nylon, 160-ft (1-loop)	1
1670-00-783-5988	Link assembly, type IV (for C-141)	1
1670-00-799-8596	Load coupler, 8-spool (Use with 5,000-lb-capacity release.)	1
5510-00-220-6146	Lumber, 2- by 4- by 60-in	2
1670-00-753-3928	Pad, energy-dissipating, honeycomb, 3- by 36- by 96-in:	5 sheets
	12- by 36-in	(7)
	12- by 62-in	(10)
	12- by 67-in	(8)
	13- by 18-in	(2)
	18- by 18-in	(13)
	18- by 48-in	(20)
	36- by 96-in	(1)
	Parachute:	
1670-00-269-1107	Cargo, G-11A or	2
1670-01-016-7841	Cargo, G-11B	2
1670-00-052-1548	Cargo, extraction, 15-ft (unreefed)	1
	Platform, airdrop, modular, 16-ft:	
1670-00-893-1631	Clevis, load tiedown	18
1670-00-893-1624	Panel	4
1670-00-893-1627	Rail, platform, side, 16-ft	2
5320-00-893-1632	Rivet, blind-drive type, 1/4-in diameter	64
5530-00-128-4981	Plywood, 3/4-in:	
	48- by 60-in	1
	18- by 48-in	2
	12- by 67-in	1
1670-01-097-8816	Release, cargo parachute, M-1 (Two 5,000-lb-capacity releases, NSN 1377-00-799-8494, may be used with the G-11A cargo parachutes.)	1
	Sling, cargo, airdrop:	
	For 5,000-lb-capacity releases:	
1670-00-753-3788	3-ft (3-loop), type X or	2
1670-01-062-6301	3-ft (2-loop), type XXVI	2

Table 2-1. Continued.

National Stock Number	Item	Quantity
	For lifting load:	
1670-00-823-5040	11-ft (3-loop), type X or	2
1670-01-063-7760	11-ft (2-loop), type XXVI	2
1670-00-823-5041	12-ft (3-loop), type X or	2
1670-01-062-6303	12-ft (2-loop), type XXVI	2
	For deployment line:	
1670-00-753-3792	12-ft (2-loop), type X (w/SL/CS) or	1
1670-01-062-6303	12-ft (2-loop), type XXVI	1
1670-00-823-5042	16-ft (3-loop), type X (w/PEFTC) or	1
1670-01-063-7761	16-ft (2-loop), type XXVI	1
7510-00-266-5016	Tape, adhesive, 2-in	As required
1670-00-937-0271	Tiedown assembly, 15-ft.	23
	Webbing:	
8305-00-268-2411	Cotton, 80-lb	As required
8305-00-082-5752	Nylon, tubular, 1/2-in	As required
8305-00-263-3591	Nylon, type VIII.	8 yd
*When this item is not used, the following items are needed for the SL/CS extraction system:		
1670-00-090-5354	Clevis assembly, suspension, large	2
1670-00-783-5988	Link assembly, type IV.	1
1670-00-998-0117	Static line, cargo parachute, breakaway type w/release knife and clevis	2
1670-00-738-5878	Strap, connector, 60-in.	1



GLOSSARY

ACB	attitude control bar
AFR	Air Force regulation
AFTO	Air Force technical order
AR	Army regulation
ATTN	attention
CB	center of balance
d	penny
DA	Department of the Army
EFTC	extraction force transfer coupling
FM	field manual
ft	feet/foot
gal	gallon
in	inches
LAPE	low-altitude parachute-extraction
lb	pound
NO	number
NSN	national stock number
PEFTC	extraction force transfer coupling (platform)
SL/CS	static line/connector strap
TM	technical manual
TO	technical order
US	United States
yd	yard



REFERENCES

- AFR 71-4/TM 38-250** Packaging and Materials Handling: Preparation of Hazardous Materials for Military Air Shipment
- FM 10-500/TO 13C7-1-5** Airdrop of Supplies and Equipment: General Information for Rigging Airdrop Platforms
- TM 9-2320-209-10** Operator's Manual for Truck, 2 1/2-Ton, 6x6, Gasoline Engine Models: M185, M185A1, M34, M35, M36, M36C, M47, M59, M342, V18A/MTQ, V17A/MTQ, M49, M49C, M50, M48, M275, M567, M292, M109, M109A1, M108, M60; Multifuel Engine Models: Truck, Van, Expansible: M292A1, M292A2, M292A5 (Body Only)
- TM 10-1670-208-20&P/
TO 13C3-4-12** Organizational Maintenance Manual Including Repair Parts and Special Tools List for Platforms, Type II Modular and LAPES/Airdrop Modular

FM 10-533/TO 13C7-3-391

5 MARCH 1984

By Order of the Secretaries of the Army and the Air Force:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

DISTRIBUTION:

Active Army, ARNG, and USAR: To be distributed in accordance with DA Form 12-11A, Requirements for Airdrop of Supplies and Equipment (Qty rqr block no. 228).

Additional copies may be requisitioned from the US Army Adjutant General Publications Center, 2800 Eastern Boulevard, Baltimore, MD 21220.